

DETAILED ACTION

Allowable Subject Matter

1. Claims 1-8 and 10-12 are allowed.
2. The following is an examiner's statement of reasons for allowance:
independent claim 1 requires the voltage control means to be "arranged to control the voltage such that the potential difference along the selected subsidiary channel is in the first direction and the potential difference in the remaining subsidiary channel or channels is in a second, opposed direction; and independent claim 11 requires the step of "applying an electrical potential difference to a portion of each branch channel in a region of the branch point, wherein the electrical potential difference applied to a selected branch channel presents the same polarity at the branch point as the electrophoretic potential and the polarity presented at the branch point by an electrical difference applied to another branch channel at the said branch point is opposed to the electrophoretic potential."

Quake '736 ("Quake I") does not disclose an embodiment in which mixture components flowing along a main channel are electrophoretically separated. Although Quake I does disclose an embodiment in which in which electroosmotic flow moves mixture components along a main channel, this flow is bulk flow.

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Even if electrophoresis was to also occur during the electroosmotic flow a selected mixture component is directed into a selected branch channel by activating a voltage at an electrode in the selected branch channel and rendering nonactive the electrode(s) in the non-selected branch channel(s). "...[B]oth branch channel electrodes are activated after the molecule [selected mixture component] has committed to the selected branch channel in order to continue bulk flow through the channels. See col. 14:21-38.

Quake WO 99/61888 A2 ("Quake II") discloses an embodiment in which electrophoresis is used to manipulate the flow of cells, particles, or reagents in one or more directions and/or into one or more channels of a microfluidic device. When a desired cell, particle, or reagent is to be directed into a particular branch channel the voltages along the other branch channels are turned "off" or a very small voltage relative to the voltage along the particular branch channel is applied along the other branch channels in order to keep cells, particles, reagents already in the other branch channels moving along their respective branch channels. See page 23, lines 5-10; page 61, lines 7-11; and page 62, line 10 – page 65, line 3.

Van den Berg '273 does not disclose an embodiment in which mixture components are electrophoretically separated along a main channel. Moreover, fluid flow is directed into a selected branch channel by a voltage control means with associated electrodes that adjusts the wall potential in the selected branch so that it is the same or at least the same polarity as that in the main channel, while the wall potential in the nonselected branch channels are of opposite

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potential or polarity to the wall potential in the main potential. This causes consistent electrosmotic flow from the main channel into the selected branch channel while an opposing electrosmotic flow moves in the nonselected branch channels towards the branching junction. See Figures 2a, 2b, 3; and col. 06:14-45.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALEX NOGUEROLA whose telephone number is (571) 272-1343. The examiner can normally be reached on M-F 8:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, NAM NGUYEN can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/Alex Noguera/
Primary Examiner, Art Unit 1795
April 9, 2008